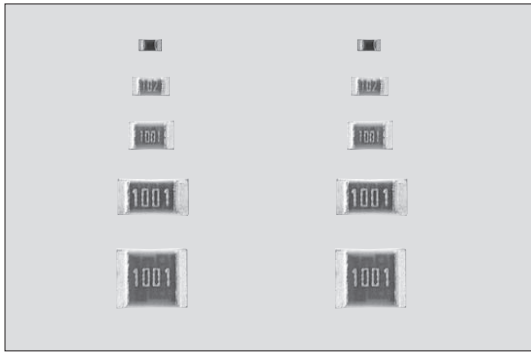


# METAL FILM (PRECISION)

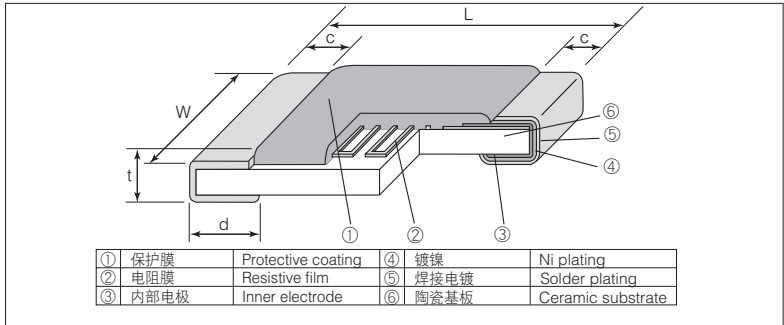


矩形片式电阻器  
Flat Chip Resistors

## RN73 矩形金属膜片式电阻器 Metal Film Flat Chip Resistors



### ■ 结构图 Construction



外观颜色: 黑色 (1E), 绿色 (1J, 2A, 2B, 2E)  
Coating color: Black (1E), Green (1J, 2A, 2B, 2E)

### ■ 特点 Features

- 是表面封装型的金属膜电阻器。
  - 以精度的±0.05%为标准对应。
  - 制造性能±5×10<sup>-6</sup>K。
  - 噪声小。
  - 适用于各种工业设备的操作电路。
  - 对应回流焊、波峰焊。
  - 但1E型只对应波峰焊。
  - 端子无铅电镀品, 符合欧盟RoHS。
  - SMD metal film resistors.
  - RN73S: Products with improved moisture resistance.
  - High precision type ±0.05% is available with standard products.
  - High performance T.C.R. ±5×10<sup>-6</sup>/K is available.
  - Low current noise.
  - Suitable for control circuits in various industrial equipment.
  - Suitable for both flow and reflow solderings.
- However, 1E type is available only for reflow soldering.
- Products with lead free termination meet EU-RoHS requirements.

### ■ 外形尺寸 Dimensions

型号 Type (Inch Size Code)	尺寸 Dimensions (mm)					Weight (g) (1000pcs)
	L	W	c	d	t	
1E (0402)	1.0 <sup>+0.1</sup> <sub>-0.05</sub>	0.5±0.05	0.2±0.1	0.25 <sup>+0.05</sup> <sub>-0.1</sub>	0.35±0.05	0.68
1J (0603)	1.6±0.2	0.8±0.1	0.3±0.1	0.3±0.1	0.45±0.1	2.14
2A (0805)	2.0±0.2	1.25±0.2	0.4±0.2	0.3 <sup>+0.2</sup> <sub>-0.1</sub>	0.5±0.1	4.54
2B (1206)	3.2±0.2	1.6±0.2	0.5±0.3	0.4 <sup>+0.2</sup> <sub>-0.1</sub>	0.6±0.1	9.14
2E (1210)		2.5±0.2				14.5

### ■ 品名构成 Type Designation

实例 Example	品种 Product Code	额定功率 Power Rating	端子表面材质 Terminal Surface Material	二次加工 Taping	公称电阻值 Nominal Resistance	阻值允许偏差 Resistance Tolerance	电阻温度系数 T.C.R. (×10 <sup>-6</sup> /K)
RN73	2B	T	TD	1002	B	25	
	1E:0.063W 1J:0.063W 2A:0.1W 2B:0.125W 2E:0.25W	T:Sn (L:Sn/Pb)	TP:2mm pitch punch paper TD:4mm pitch paper TE:4mm pitch plastic embossed BK:Bulk	4 digits	A:±0.05% B:±0.1% C:±0.25% D:±0.5% F:±1%	05 10 25 50 100	

端子表面材质, 以无铅电镀品为准。  
欲知关于此产品含有的环境有害物质详情(除EU-RoHS以外), 请与我们联系。  
编带细节请参考卷末附录C。  
The terminal surface material lead free is standard.  
Contact us when you have control request for environmental hazardous material other than the substance specified by EU-RoHS.  
For further information on taping, please refer to APPENDIX C on the back pages.

### ■ 参考标准 Reference Standards

IEC 60115-8  
JIS C 5201-8  
EIAJ RC-2133A

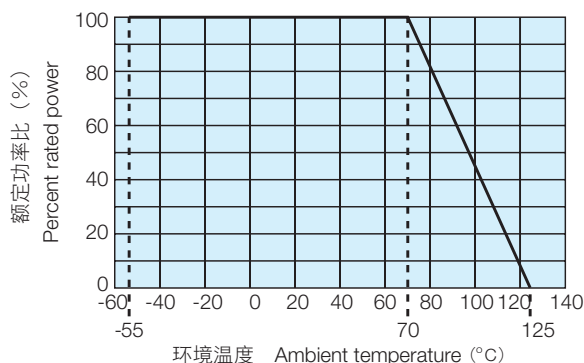
### ■ 额定值 Ratings

型号 Type	额定功率 Power Rating	电阻温度系数 T.C.R. (×10 <sup>-6</sup> /K)	电阻值范围 Resistance Range (Ω) E24 • E96 • E192 <sup>*2</sup>					最高使用电压 Max. Working Voltage	最高过载电压 Max. Overload Voltage	编带和包装数/卷 Taping & Q'ty/Reel (pcs)		
			A: ±0.05%	B: ±0.1%	C: ±0.25%	D: ±0.5%	F: ±1%			TP	TD	TE
			±25	±50	±5	±10	±25					
1E	0.063W	±25	—	100~100k	100~100k	10~120k	10~120k	25V	50V	10,000	—	—
1J	0.063W	±50	—	100~100k	100~100k	10~120k	10~120k	50V	100V	—	5,000	—
		±5	1k~47k	100~47k	—	—	—					
		±10	1k~47k	100~47k	100~47k	100~47k	100~47k					
		±25	1k~47k	15~360k	15~360k	10~360k	10~360k					
2A	0.1W	±50	—	15~360k	15~360k	10~360k	10~360k	100V	200V	—	5,000	4,000
		±5	100~100k	100~100k	—	—	—					
		±10	100~100k	100~100k	100~100k	100~100k	100~100k					
		±25	51~100k	15~1M	15~1M	10~1M	10~1M					
2B	0.125W	±50	—	15~1M	15~1M	10~1M	10~1M	150V	300V	—	5,000	4,000
		±5	100~300k	100~300k	—	—	—					
		±10	100~300k	100~300k	100~300k	100~300k	100~300k					
		±25	51~300k	15~1M	15~1M	10~1M	10~1M					
2E	0.25W	±50	—	15~1M	15~1M	10~1M	10~1M	200V	400V	—	5,000	4,000
		±5	100~510k	100~510k	—	—	—					
		±10	100~510k	100~510k	100~510k	100~510k	100~510k					
		±25	51~510k	15~1M	15~1M	10~1M	10~1M					

额定环境温度 Rated Ambient Temperature : +70℃  
使用温度范围 Operating Temperature Range: -55℃~+125℃  
额定电压是√额定功率×公称电阻值所算出的值或表中最高使用电压两者中小的值为额定电压。  
Rated voltage = √Power Rating×Resistance value or Max. working voltage, whichever is lower.

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Malfunction or failure of the products in such applications may cause loss of human life or serious damage.

## ■ 负荷减轻特性曲线 Derating Curve



在环境温度70℃以上使用时，应按照上图负荷减轻特性曲线，减小额定功率。

For resistors operated at an ambient temperature of 70°C or above, a power rating shall be derated in accordance with the above derating curve.

## ■ 性能 Performance

试验项目 Test Items	标准值 Performance Requirements $\Delta R \pm (\% + 0.05 \Omega)$		试验方法 Test Methods
	保证值 Limit	代表值 Typical	
电阻值 Resistance	在规定的允许偏差内 Within specified tolerance	-	25°C
电阻温度系数 T.C.R.	在规定的值以内 Within specified T.C.R.	-	+25°C/+125°C : T.C.R. = $\pm 5 (\times 10^{-6}/K)$ +25°C/-55°C and +25°C/+125°C : another
过载 (短时间) Overload (Short time)	0.1	0.01	额定电压×2.5倍或最高过载电压中低的一方施加5秒钟 Rated voltage × 2.5 or Max. overload vol., whichever is less, for 5s
耐焊接热 Resistance to soldering heat	0.1	0.04	260°C ± 5°C, 10s ± 1s
温度突变 Rapid change of temperature	0.25	0.03	-55°C (30min.) / +125°C (30min.) 5 cycles
耐湿负荷 Moisture resistance	0.5	0.06	40°C ± 2°C, 90%~95%RH, 1000h 1.5小时ON、0.5小时OFF的周期 1.5h ON/0.5h OFF cycle
在70°C时的耐久性 Endurance at 70°C	0.25	0.02	70°C ± 2°C, 1000h 1.5小时ON、0.5小时OFF的周期 1.5h ON/0.5h OFF cycle
高温放置 High temperature exposure	0.25	0.03	+125°C, 1000h

## ■ 使用注意事项 Precautions for Use

- 部件的编带材料使用的是采取合适的防静电措施的物质，但在实际情况下，有过度干燥状态的情况，以及编带包装后施加了长时间振动后，项带上产品吸附了静电，产生装载不良、部件受到静电（在人体模型100pF，1.5kΩ，超过1kV：1J, 2A, 2B, 2E，超过0.5kV：1E）破坏，电阻值有发生变化的危险，要注意。
- 在安装基板时，同样地要注意不使施加过度的静电。在本产品和安装的印刷电路板上由于助焊剂等附着了离子性杂质时，耐湿性·耐腐蚀性等方面就不理想。在助焊剂内，有时会含有氯·酸等的离子性物质。要除去这类离子性物质，应进行清洗。特别是使用无铅助焊剂时，由于提高了湿润性，有时会含有大量离子性物质。使用RMA系的焊锡或助焊剂时，应进行充分清洗。还有，由于保管环境和安装条件·环境等，附着了汗·盐等离子性物质时，耐湿性·耐腐蚀性等方面就不理想。对于这种污染，为除去这类离子性物质，应当进行清洗。产品受到含有人的汗和唾液等的钠、氯等离子性杂质污染时，会引起电蚀的事已得到确认。因此，在保管·装载或使用时要防止污染。特别是涂上防湿涂层材料时，在产品和防湿涂层之间残留了上述杂质时，已确认会进一步引起电蚀。在已经被确认污染时，应当用纯水等清洗干燥，不使离子性物质残留。
- 注意烙铁不要直接接触产品，有发生电阻值变化的危险。并且，烙铁直接接触保护层时，有瞬间炭化的危险，电蚀的耐候性和保护涂层的绝缘性也会降低，应注意。烙铁温度非常高时，同样可造成保护层的老化，应注意。
- 这一产品的保管，要避免阳光直射、高温、多湿。阳光直射，会引起编带变质，难以保持适当的剥离强度。在5~35°C/35~75%RH以下时，交货后12个月内，焊接性不会降低，但由于结露、有毒气体（硫化氢、二氧化硫、氯化氢等）、灰尘，焊接性会降低，因此，在保管上要充分注意。
- 耐热屏蔽胶带连接到安装的芯片电阻器，上部电极可能被剥离。据证实，由于暴露载在高温下安装附着力量变得更加牢固。因此，我们建议用控制使用胶带。如果耐热屏蔽胶带不可避免被使用，请确保胶带粘合剂不直接与产品接触。
- The properly and electrostatically measured taping materials are used for the components, but attention should be paid to the fact that there is some danger the parts absorb on the toptapes to cause a failure in the mounting and the parts are destructed by static electricity (1kV and more : 1J, 2A, 2B, 2E 0.5kV and more : 1E, Human Body Model 100pF 1.5kΩ) to change theresistance in the conditions of an excessive dryness or after the parts are given vibration for a long time as they are packaged on the tapes. Similarly, care should be given not to apply the excessive static electricity when mounting on the boards.
- Ionic impurities such as flux etc. that are attached to these products or those mounted onto a PCB, negatively affect their moisture resistance, corrosion resistance, etc. The flux may contain ionic substances like chlorine, acid, etc. while perspiration and saliva include ionic impurities like sodium (Na<sup>+</sup>), chlorine (Cl<sup>-</sup>) etc. Therefore these kinds of ionic substances may induce electrical corrosion when they invade into the products. Either thorough washing or using RMA solder and flux are necessary since lead free solder contains ionic substances. Washing process is needed, before putting on moisture proof material in order to prevent electrical corrosion.
- Please pay attention that the top of an iron does not direct touch to the components. There is a risk that may cause a change in resistance. Take care that another risk may happen that the protecting coat is carbonized in an instant when touched directly by the top of the iron, also climatic-proof for electric corrosion or insulation of protecting coat may be dropped down. Be sure not to give high temperature on the top of the iron as it will degrade the protecting coat.
- Avoid storing components under direct sun rays, high temperature/humidity. Direct sun rays will cause quality change of taping and difficulty of keeping appropriate peeling strength. 5~35°C/35~75%RH, there is no deterioration of solderability for 12 months, but take special care for storing, because condensation, dust, and toxic gas like hydrogen sulfide, sulfurous acidgas, hydrogen chloride, etc. may drop solderability.
- The upper electrodes could be peeled off when a heat-resistant masking tape is attached to the mounted chip resistors and then detached from them. It is confirmed that the adhesiveness gets stronger due to the exposure to heat under mounting. Accordingly, we recommend the use of masking tape be refrained. If the use of heat-resistant masking tape is unavoidable, please make sure that the adhesives on the tape do not directly come in contact with the product.